

A new species of *Phylloscartes* (Tyrannidae) from the mountains of southern Bahia, Brazil

by Luiz Pedreira Gonzaga & José Fernando Pacheco

Received 24 May 1994

Following an indication of D. Willis (verbally 1992) of recent discoveries by himself and other birdwatchers in the vicinity of Boa Nova, southern Bahia (see Forrester 1993), we took advantage of a planned trip to this locality to look for and survey remaining patches of Atlantic forest. Our surveys were undertaken between 30 August and 6 September 1992 and from 24 to 28 August 1993 (Gonzaga *et al.* in press).

What we found confirmed our initial suspicion that a very important area existed there that had gone virtually unnoticed by earlier workers: tiny remnants of a formerly extensive montane forest that occurred in this portion of Bahia, delineating at once the westernmost and the highest (1000–1100 m) elevational limits of the Atlantic forest domain in the region, known as the Serra da Ouricana. The humid Atlantic forest on the seaward slopes of this ridge gives way just a few kilometres to the west to the *mata-de-cipó* (semi-deciduous forest), best known to ornithologists for its endemic genus *Rhopornis* (see Collar *et al.* 1992: 679).

Among the 220 species recorded in this neglected habitat, 27 represent range extensions of several hundred kilometres, and several others were preceded only by single or a few old, disputed records from Bahia. In addition, a spinetail *Synallaxis* sp. and a tyrannulet *Phylloscartes* sp. that we tape-recorded and collected near Boa Nova proved to be undescribed taxa. The spinetail forms a clear link in both morphological and vocal characters between Rufous-capped Spinetail *S. ruficapilla* from the serras of the southeast and Plain Spinetail *S. infusata* from the northeast (Gonzaga & Pacheco in prep.). The tyrannulet belongs in a group that includes the Mottle-cheeked Tyrannulet *P. v. ventralis* from the southeast and Long-tailed Tyrannulet *P. ceciliae* from the northeast. Here we describe this new *Phylloscartes*, as follows:

***Phylloscartes beckeri* sp. nov.**

Holotype. Museu de Zoologia da Universidade de São Paulo (MZUSP) no. 73.706; male (skull not fully pneumatized, testes 6–7 mm) from 7 km southeast of Boa Nova, Bahia, eastern Brazil (14°23'20"S, 40°08'46"W), elevation 1000 m; collected 6 September 1992 by J.F.P., prepared as a skin by L.P.G.; no moult, plumage fresh.

Paratypes. MZUSP no. 73.707; female (skull not fully pneumatized, ovary 6 mm, with the ova and the oviduct minute), same location, date, and collectors; paired with the holotype; no moult, plumage fresh.

MZUSP no. 73.708; male (skull not fully pneumatized, testes 6 mm), same location, date, and collectors; no moult, plumage fresh.

MZUSP no. 73.709; male (skull not fully pneumatized, testes 3–5 mm), same location; collected 3 September 1992 and skinned by L.P.G.; no moult, plumage fresh.

Diagnosis—morphology. The placement of this new taxon in *Phylloscartes* is difficult to justify objectively, since the definition of this genus as it stands (e.g. Traylor 1979) is clearly unsatisfactory, as Graves (1988) has pointed out, and even the species that have been attributed to *Phylloscartes sensu stricto* may actually comprise a polyphyletic assemblage. No synapomorphy has so far been indicated to define this genus, which has been recognised by a combination of rather vague morphological and, especially in the past decade or so, behavioural characters instead. This notwithstanding, by its pattern of plumage colouration, proportions, and behaviour, *P. beckeri* clearly belongs in a group of species that includes *P. ventralis*, the type of *Phylloscartes* Cabanis and Heine.

From *P. ventralis* and the recently described Restinga Tyrannulet *P. kronei*, *P. beckeri* differs in colouration by having buff supraloral stripes and eye rings, rather than whitish or yellowish superciliary lines. Crown and nape in *P. beckeri* are distinctly darker, greyish-green, blending into a brighter green back, rather than nearly concolour with back as in those species. *P. kronei* is described (Willis & Oniki 1992) as having black tarsi and feet in life, while fresh specimens of *P. beckeri* had these parts pale grey, becoming brownish in dried skins. The wing markings (coverts, secondaries) are more pronounced in *P. beckeri* than in *P. ventralis*, owing to the darker background of the former's feathers. *P. beckeri* is further distinguished from *P. ventralis* by having the breast less olivaceous and the belly paler yellow.

P. beckeri is distinguished at once from *P. ceciliae* (Teixeira 1987a) by yellowish as opposed to whitish underparts, greyish crown, and lack of whitish superciliary stripes.

Diagnosis—voice. All these species (*P. beckeri*, *P. ventralis*, *P. kronei* and *P. ceciliae*) also differ from each other by vocal characters (see Vocalisations, below). The main feature of the song of *P. beckeri* is its variety of relatively weak notes, as compared to the songs of *P. ventralis* and *P. ceciliae*, which are simpler, more level-pitched sequences of repeated, louder notes.

Distribution. Known only from montane forest fragments around the type-locality. This is almost 700 km away from the nearest patches of montane Atlantic forest (in serras of eastern Minas Gerais and Espírito Santo) to the south, the nearest area where *P. ventralis* has been recorded, and half-way between these and forests in Alagoas to the northeast, where *P. ceciliae* occurs (Fig. 1).

Description of holotype. Upperparts Olive-Green (colour 47; capitalized colour names with numbers refer to closest colours in Smithe [1975, 1981]), crown feathers grey in centre. Base of upperparts feathers Dark Neutral Gray (colour 83). Narrow eye-rings and supraloral stripes Buff (colour 124). Short postocular superciliary lines Cream Color (colour 54). Narrow dusky lines through eyes. Auriculars

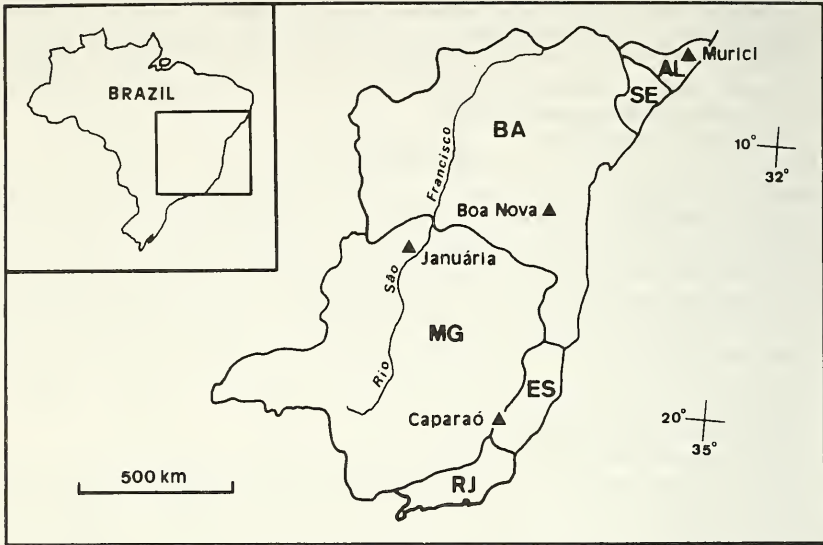


Figure 1. Map of eastern Brazil showing the type-localities of *Phylloscartes beckeri* sp. nov. (Boa Nova, Bahia), *P. ceciliae* (Murici, Alagoas), *P. roquettei* (Januária, Minas Gerais) and northernmost record of *P. v. ventralis* (Caparaó, Minas Gerais/Espírito Santo).

dark yellow with brownish tips, forming narrow dusky facial crescents. Chin whitish. Throat and breast dirty white flecked with Sulphur Yellow (colour 57). Centre of belly and crissum pale Sulfur Yellow (colour 157). Sides of breast and flanks tinged olive. Base of underparts feathers Blackish Neutral Gray (colour 82). Remiges Sepia (colour 119), fringed narrowly on distal webs with Olive-Yellow (colour 52) and broadly on the proximal webs with whitish; distal webs of secondaries, especially innermost, with broad whitish apical spots. Lesser upper wing coverts black with Olive-Green borders; alula, median and greater upper coverts of primaries black fringed with Olive-Green on distal webs; the other median and greater upper wing coverts black fringed with Olive-Green, the median on proximal webs and the greater on distal webs, and with broad pale Sulphur Yellow (colour 57) tips, forming two wing bars; bend of wing and under wing coverts pale Sulphur Yellow (colour 57). Rectrices Vandyke Brown (colour 221), narrowly fringed on outer webs with Yellowish Olive-Green (colour 50), tips whitish. Soft part colours: irides brown; bill brown except basal two-thirds of the mandible, which are pearl-coloured; tongue and gape orange; feet pale bluish-grey (brownish in dried specimen). Wing formula: p7 and p8, of nearly equal length, are the longest primaries, p6 and p9 slightly shorter; p10 6 mm shorter than p9 and nearly equal to p1; p5 slightly shorter than p6, p4 slightly shorter than p5, p3 slightly shorter than p4, p2 slightly shorter than p3 and slightly longer than p1.

TABLE 1

Measurements (mm) and mass (g) of the type specimens of *Phylloscartes beckeri* sp. n. compared to mean values of *P. ventralis* (Willis & Oniki 1992) and *P. ceciliae* (calculated from data in Teixeira 1987a)

Specimen	sex	wing ^a	tail	culmen	tarsus	total length	mass
MZUSP 73706	♂	54/53	52	7 ^b /12 ^c	18	120	8.5
MZUSP 73708	♂	55/54	51	7/12	19	120	8.5
MZUSP 73709	♂	54/52	51	7/12	19	120	9.0
MZUSP 73707	♀	50/48	46	7/12	18	115	7.5
mean	♂♂	54.3/53	51.3	7/12	18.7	120.0	8.7
s.d.		0.58/1	0.58	0/0	0.58	0	0.29
<i>P. ventralis</i>							
mean	♂♂	—/54.1	52.7	—/13.9 ^c	19.4	—	—
s.d.		—/2.3	2.4	—/0.6	0.8	—	—
n		—/29	30	—/30	30	—	—
mean	♀♀	—/49.9	48.8	—/13.5	18.4	—	—
s.d.		—/1.7	2.2	—/0.5	0.7	—	—
n		—/19	18	—/17	19	—	—
<i>P. ceciliae</i>							
mean	♂♂	57.2/—	57.0	—/10.6 ^d	17.1	127.5	8.4
s.d.		1.1/—	0.9	—/0.1	0.6	5.0	0
n		2/—	2	—/2	2	2	2
mean	♀♀	50.9/—	50.8	—/9.4	16.4	117.0	7.0
s.d.		0.5/—	0.9	—/0.5	0.4	3.0	0.3
n		2/—	2	—/2	2	2	2

^aflat/chord; ^bfrom anterior edge of nostril; ^cfrom skull; ^dexposed culmen.

Description of female (paratype). Like holotype but yellow more saturated on breast and throat; crown and nape less greyish; mandible with a pre-apical (instead of apical) dusky mark.

Variation among male paratypes. No appreciable variation was found.

Measurements. As in *P. ceciliae* (Teixeira 1987a), *P. kronei* and *P. ventralis* (Willis & Oniki 1992), *P. oustaleti* and *P. paulistus* (Gonzaga unpub. data), males of *P. beckeri* seem to be slightly larger than females, which is indicated by the mass, total length, wing and tail measurements of its type specimens (Table 1). No significant difference (two-tailed *t*-tests) in measurements was found between these males and those of a larger series of *P. ventralis* (*cf.* Willis & Oniki 1992), except that the culmen was slightly but significantly shorter ($P < 0.01$) in *P. beckeri* (which also has weaker rictal bristles). The tails of two adult males of *P. ceciliae* (*cf.* Teixeira 1987a) are significantly longer ($P < 0.01$) than those of males of either *P. beckeri* or *P. ventralis*.

Specimens examined (all from MZUSP). *P. ventralis* and *P. kronei*—same as in Willis & Oniki (1992), except types of the latter not examined.

P. oustaleti—**Bahia:** Boa Nova 1♂; **Espírito Santo:** Chaves (Santa Leopoldina) 3♂, 1♀; **Rio de Janeiro:** Teresópolis 2♂, 2♀; **São Paulo:** 1 sex? (♀ by measurements); Salesópolis (Boracéia) 3♂, 1♀; Alto da Serra

1♂; Caraguatatuba 2♂; Tamanduá (rio Ipiranga) 1♂; Estação Engenheiro Ferraz 5♀, 3 sex? (one being ♂ and the others ♀ by measurements); Iporanga 2♂; Iguape 1 sex? (♂ by measurements); Ribeirão Fundo 1♂.

P. paulistus—**Espírito Santo**: Chaves (Santa Leopoldina) 1♂; **São Paulo**: Estação Engenheiro Ferraz 1♂; Victoria (=Botucatu) 1♀; Assis (Corredeira das Flores) 1♀; Poço Grande (rio Juquiá) 1♀.

P. difficilis—**São Paulo**: Serra da Bocaina 1 sex?; Alto da Serra 1♀.

Etymology. We are pleased to name this species after our good friend, the Bahian entomologist Johann Becker of the Museu Nacional do Rio de Janeiro, in recognition of his long-standing interest in several fields of natural history. He has influenced and aided many students and young biologists who have had the opportunity to be in contact with him, as we have had over the years; all have benefitted from his vast knowledge and tireless willingness to help.

English name. We propose Bahia Tyrannulet as the English name of this new taxon because it is the only species of *Phylloscartes* known to be endemic to this area.

Habitat and behaviour

All of the individuals we found of this new taxon were in only three forest fragments, all dissected by mountain streams. One (the type-locality) was a highly disturbed, possibly old secondary, patch of Atlantic forest near the summit of the mountain (900–1100 m), crossed by a trail which led directly down to the main road *c.* 8 km southeast of Boa Nova. The second is a tract of forest reaching lower levels (750–1000 m) in the same range *c.* 13 km east of Boa Nova by the same road, and crossed by an equally good trail (see Forrester 1993) along which *P. beckeri* was found at elevations above 900 m. Another and more extensive patch (*c.* 300 ha?) of similar habitat in much better condition in the vicinity of the latter was found during our expedition in 1993, but owing to difficulties of access only a preliminary survey could be undertaken. This site was revisited by J.F.P. and B. M. Whitney in November 1993.

Due to our concern about the evident plight of these forests and their birds, and given the immediately apparent distinctness of the plumage and voice of *P. beckeri*, we made no further attempts to enlarge our type series. Not many (approximately ten?) other pairs were recorded, either at the type-locality or in the other forests surveyed.

Individuals of *P. beckeri* were observed foraging primarily in the upper one-third or one-quarter of trees both at the forest edge and in the interior of forest, ranging from about 6 to 12 m above ground. Birds foraged in pairs or small, possibly family groups (maximum of four together), and almost always travelled with mixed-species flocks of insectivores which sometimes included some frugivores. Search movements were primarily short hops and flutters during which the wings were sometimes drooped slightly and frequently flicked shallowly (B. M. Whitney), and the tail was cocked above the horizontal, like other species of *Phylloscartes* (e.g. Teixeira 1987a, Willis & Oniki 1991, 1992; pers. obs.). This tail-cocking motion was

often accomplished in a series of 3 to 5 shallow, rapid, upward flicks in a period of about one second, sometimes elevating the tail nearly to the vertical (B. M. Whitney). Short flights were often accompanied by a noisy flutter of wings, as in *P. ventralis* and *P. kromei* (Willis & Oniki 1992; pers. obs.), and perhaps some other *Phylloscartes* species. Individuals occasionally remained still on a perch for up to about 20 seconds, apparently scanning visible leaf surfaces both in front and overhead (B. M. Whitney).

Most foraging manoeuvres (nomenclature following Remsen & Robinson 1990) were laterally and slightly upward-directed, semi-circular sally-hovers of less than 0.5 m range; the birds also performed short forward reaches, flutter-chases and, least often, sally-strikes and stalls in which the wings were mostly closed (B. M. Whitney). Most foraging was done at or near the peripheral leaves and twigs of the trees, with relatively little time spent in the interior half of tree crowns. Arthropod prey included very small insects. On one occasion an insect about 2 cm long was obtained in a sally-hover to a leaf on the outer edge of a tree, and was held in the bill and briefly beaten against a limb before being swallowed (B. M. Whitney). The stomachs of four specimens (the type series) collected in the morning contained remains of Coleoptera (75% of all identifiable food items and 100% of stomachs) including Curculionidae, also Diptera Brachycera (imago and larva), Lepidoptera, Hemiptera and Dermaptera.

Occasionally among the flock associates of *P. beckeri* was Oustalet's Tyrannulet *P. oustaleti* (which we tape-recorded and collected at the type-locality of *P. beckeri*, documenting a significant range extension; see also Gonzaga *et al.* in press), which parallels this latter species's sympatry with *P. ventralis* in certain localities in the Serra do Mar further south (Willis & Oniki 1981a; pers. obs.).

Vocalisations

Members of a pair often uttered *tik* contact notes (Fig. 3d,e) which were very inconspicuous; we also recorded an equally faint twittery song (Fig. 2a,b) given apparently in response to playback usually some time after it or from time to time spontaneously by paired foraging birds (see also Fig. 3a). Neither this song nor the contact call elicited response from one pair of *P. ventralis* at the Itatiaia massif, Rio de Janeiro, in January 1994; foraging pairs of *P. beckeri* that were presented with playback of *P. ventralis*'s voices (Fig. 2c,d, Fig. 3b,c,f) in August 1993 did not respond either.

However, birds reacted immediately to the playback of their own species' voices, calling back, stopping foraging and approaching the observer in search for the sound source. Birds of both species thus tested descended from higher levels of vegetation to a few metres above ground, where they remained silently while taped voices were played again. No voice of *P. ceciliae* (Fig. 2e, Fig. 3g) was tested against either *P. beckeri* or *P. ventralis*.

As the sonagrams (produced by B. M. Whitney on a Macintosh IIsi computer using Canary 1.1 software; FFT frame length 128 points, filter bandwidth 706 Hz) illustrate, songs and calls of these three

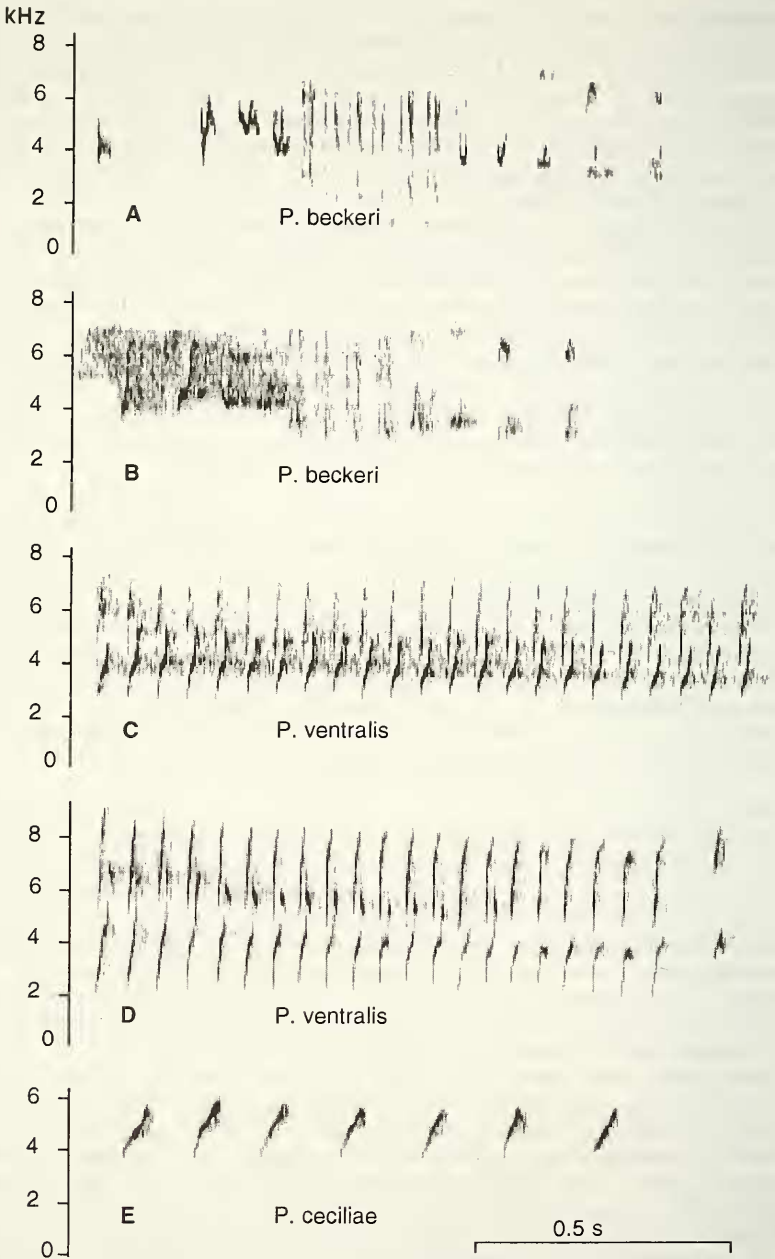


Figure 2. Sound spectrograms of voices of *Phylloscartes* spp.: *P. beckeri* sp. nov.—(A,B) songs of one individual (holotype), J. F. Pacheco, 6/9/92, Boa Nova, BA; *P. ventralis*—(C) song, P. S. Fonseca, 18/1/88, Teresópolis, RJ; (D) song, J. F. P., 5/4/92, Teresópolis, RJ; *P. ceciliae*—(E) probable song, B. M. Whitney, 20/10/90, Murici, AL.

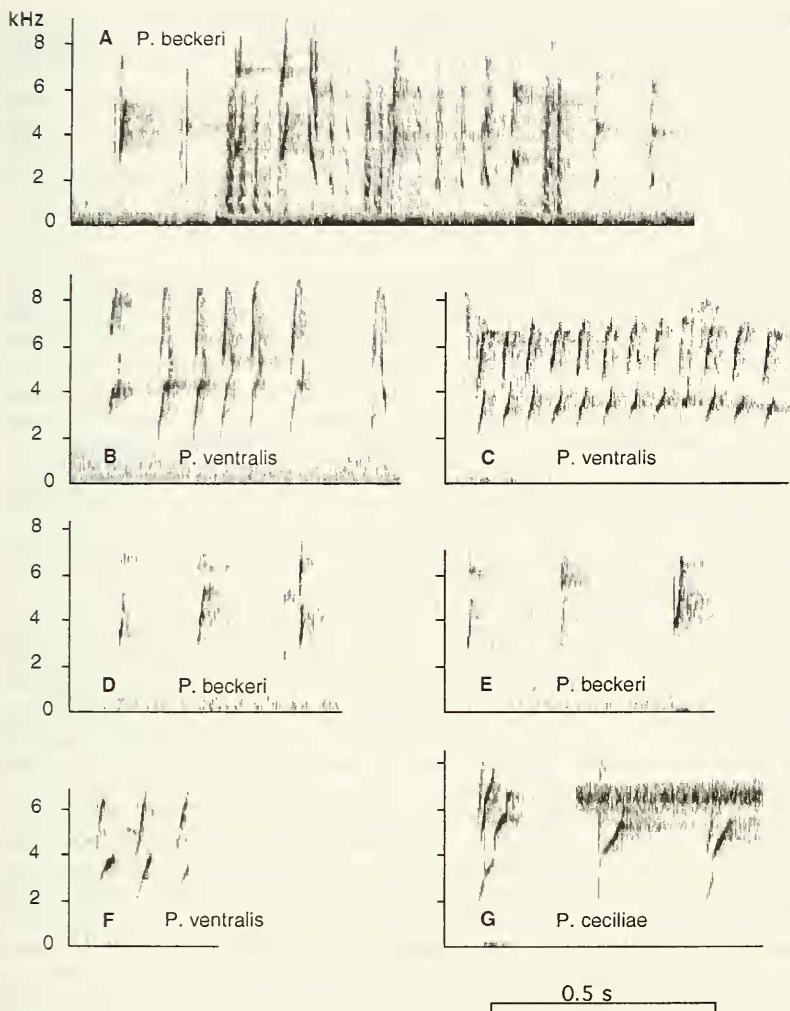


Figure 3. *P. beckeri* sp. nov.—(A) song and wing flutters (tall verticals 0.2–6 kHz) of interacting members of a pair, L. P. Gonzaga, 24/8/93, Boa Nova, BA; (D,E) contact calls, probably one individual (paratype), J. F. P., 6/9/92, Boa Nova, BA; *P. ventralis*—(B) variation of song, same individual as in Fig. 2D, J.F.P., 5/4/92, Teresópolis, RJ; (C) short 'song', P. S. F. 15/2/88, Itatiaia Nat. Park, RJ; (F) contact call, P. S. F., 20/2/88, Teresópolis, RJ; *P. ceciliae*—(G) single-note call and two-note call, B. M. W., 20/10/90, Murici, AL.

species differ markedly from each other in rhythm, harmonic structure and modulation of individual notes. We did not hear from *P. beckeri* anything like the *feesee* call of *P. kronei* (sonagram in Willis & Oniki

1992), and the song of the Minas Gerais Tyrannulet *P. roquettei* (sonagram in Willis & Oniki 1991) is apparently also very different from that of *P. beckeri*.

Copies of recordings are or will be deposited in the Arquivo Sonoro Prof. Elias Coelho (ASEC) of the Universidade Federal do Rio de Janeiro, Arquivo Sonoro Neotropical (ASN) of the Universidade Estadual de Campinas, and Library of Natural Sounds (LSN) of Cornell University.

Conservation

Atlantic forest has virtually disappeared from the mountain tops and lower slopes of the Serra da Ouricana around Boa Nova owing to the expansion of pastureland and cultivation. All the sites we visited were privately owned and under pressure from clearance and fire spreading from neighbouring cleared areas. This situation and the very limited size of these fragments give cause for special concern, since they were almost certainly the only remnants of Atlantic forest in the region, as we could judge from observations made from high look-out points, interviews with local people, and exploration in random search of other forest patches. Searching for a suitable area for creation of a conservation unit of this habitat and its birds at equivalent altitudes along the Serra da Ouricana is, therefore, an urgent need, and probably the only hope for the continued survival of *P. beckeri*.

It is unfortunate that since the Slender Antbird *Rhopornis ardesiaca* was rediscovered near Boa Nova (Naumburg 1934), most subsequent efforts of ornithologists at this locality have apparently been directed exclusively or mainly to locating and studying this bird in the *mata-de-cipó* (e.g. Willis & Oniki 1981b, Teixeira 1987b), and the existence of Atlantic forest a few kilometres to the east has thus remained unnoticed for so long.

Eight threatened species included in Collar *et al.* (1992) have been recorded in the study area: Golden-capped Parakeet *Aratinga auricapilla*, Blue-chested Parakeet *Pyrrhura cruentata*, Golden-tailed Parrotlet *Touit surda*, Striated Soft-tail *Thripophaga macroura*, Black-headed Berryeater *Carpornis melanocephalus*, Buff-throated Purpletuft *Iodopleura pipra*, Cinnamon-vented Piha *Lipaugus lanioides*, and Fork-tailed Pygmy-tyrant *Hemitriccus furcatus*. *P. beckeri* and the still undescribed *Synallaxis*, found too late to have been considered for inclusion in the Red Data Book, are clearly threatened species that should be added to this list. In addition, many near-threatened species (*sensu* Collar *et al.* 1992) also have been recorded there.

The above figures alone indicate the magnitude of conservation concern that the Serra da Ouricana deserves. Its plight can be paralleled in the Atlantic forest region perhaps only by that of highland forests in Alagoas where, however, some conservation measures are at least now incipient (see Collar *et al.* 1992: 602, 630), well before those forests have been subjected to the dire circumstances surrounding the continued existence of the montane forests of southern Bahia. Considered together with the adjoining and also highly endangered *mata-de-cipó* which harbours a distinctly different avifauna that

includes several endemic and threatened birds (Collar *et al.* 1992: 680), forest habitats in the Boa Nova area are probably the most neglected habitats in Brazil with regard to bird conservation, and their endemic birds are among the most endangered on earth.

Acknowledgements

We are deeply indebted to Bret Whitney for his continuous help, critical reading of the manuscript and invaluable contributions to it. Gloria D. A. Castiglioni and Claudia Bauer assisted in preparation of skins and examining museum specimens. Paulo Sergio Fonseca also joined field parties. We are grateful also to Douglas F. Stotz and Helio F. A. Camargo for help while in charge of the ornithological collection of MZUSP, and to Dave Willis and Paul Gadd for calling our attention to the Boa Nova area. Support to ASEC came from the Conselho Nacional de Desenvolvimento Científico e Tecnológico and the Fundação Universitária José Bonifácio.

References:

- Collar, N. J., Gonzaga, L. P., Krabbe, N., Madroño Nieto, A., Naranjo, L. G., Parker, T. A. III & Wege, D. 1992. *Threatened birds of the Americas: the ICBP/IUCN Red Data Book*. Cambridge, U.K.: International Council for Bird Preservation.
- Forrester, B. C. 1993. *Birding Brazil: a check-list and site guide*. John Geddes, Irvine.
- Gonzaga, L. P., Pacheco, J. F., Bauer, C. & Castiglioni, G. D. A. in press. An avifaunal survey of the vanishing montane Atlantic forest of southern Bahia, Brazil. *Bird Conservation International*.
- Graves, G. R. 1988. *Phylloscartes lanyoni*, a new species of bristle-tyrant (Tyrannidae) from the lower Cauca valley of Colombia. *Wilson Bull.* 100: 529–534.
- Naumburg, E. M. B. 1934. Rediscovery of *Rhopornis ardesiaca* (Wied). *Auk* 51: 493–496.
- Remsen, J. V. Jr. & Robinson, S. K. 1990. A classification scheme for foraging behavior of birds in terrestrial habitats. *Studies in Avian Biology* no. 13: 144–160.
- Smithe, F. B. 1975, 1981. *Naturalist's Color Guide*. American Museum of Natural History, New York.
- Teixeira, D. M. 1987a. A new tyrannulet (*Phylloscartes*) from northeastern Brazil. *Bull. Brit. Orn. Cl.* 107: 37–41.
- Teixeira, D. M. 1987b. Notas sobre o "gravatazeiro", *Rhopornis ardesiaca* (Wied, 1831). *Revta Bras. Biol.* 47: 409–414.
- Traylor, M. A. (ed.) 1979. *Check-list of Birds of the World*. Vol. 8. Museum of Comparative Zoology, Harvard.
- Willis, E. O. & Oniki, Y. 1981a. Levantamento preliminar de aves em treze áreas do estado de São Paulo. *Revta Bras. Biol.* 41: 121–135.
- Willis, E. O. & Oniki, Y. 1981b. Notes on the Slender Antbird. *Wilson Bull.* 93: 103–107.
- Willis, E. O. & Oniki, Y. 1991. Avifaunal transects across the open zones of northern Minas Gerais, Brazil. *Ararajuba* 2: 41–58.
- Willis, E. O. & Oniki, Y. 1992. A new *Phylloscartes* (Tyrannidae) from southeastern Brazil. *Bull. Brit. Orn. Cl.* 112: 158–165.

Address: Luiz Pedreira Gonzaga and José Fernando Pacheco, Depto. Zoologia, Universidade Federal do Rio de Janeiro, C.P. 68033, 21944-970 Rio de Janeiro, RJ, Brazil.